

REACTORS HAVING MULTIPLE ELECTRODES AND/OR ENCLOSED
RECIPROCATING PADDLES, AND ASSOCIATED METHODS

ABSTRACT OF THE DISCLOSURE

Reactors having multiple electrodes and/or enclosed reciprocating paddles are disclosed. The reactor can include multiple electrodes spaced apart from a process location to provide virtual electrodes proximate to the process location for transferring material to or from the workpiece. A magnet may be positioned proximate to the process plane to orient magnetically sensitive material deposited on the workpiece. The electrodes may be removable from the reactor without passing them through the magnet to reduce interference between the electrodes and the magnet. The workpiece may be carried by a rotatable workpiece support to orient the workpiece for processing. At least one of the electrodes can operate as a current thief to reduce terminal effects at the periphery of the workpiece. An electric field control element positioned between the electrodes and the workpiece circumferentially varies the effect of the thieving electrode current to account for effects created by elongated paddles as they oscillate proximate to the workpiece.